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PATENT ABSTRACTS OF JAPAN

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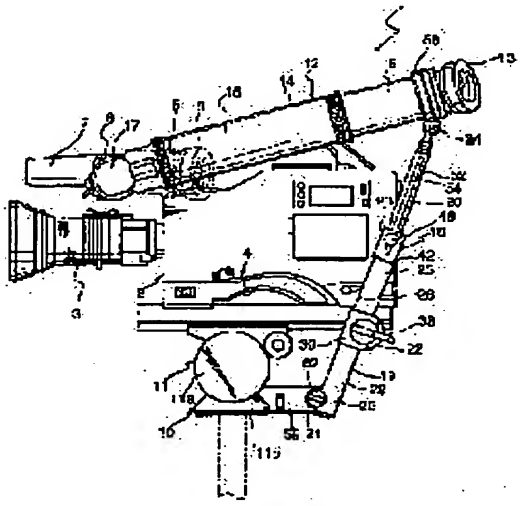
(54) IMAGE PICKUP DEVICE

(57)Abstract:
PROBLEM TO BE SOLVED: To adjust an eyepiece section to an optimum position independently of a posture of the image pickup device by expanding/contracting a finder support member so as to adjust the position of the eyepiece section.
SOLUTION: A finder support member 18 is made up of a main arm whose upper end (lower end) connects to a view finder 12 and tripod 10 and up of an elevating/descending arm 20 that is supported in the inside of the main arm 19 and is freely expanded/contracted vertically from an upper end of the main arm 19. An operation handle 38 is turned to expand/contract vertically the elevating/descending arm 20 so as to adjust the entire length of the finder support member 18 thereby changing vertically a position of a finder connection section 24. Then the view finder 12 is turned upward or downward around a support 21, then the view finder takes an optimum state to allow the user to peep an eyepiece section 13 from the back part of the camera 1. Furthermore, the length of a mirror barrel 14 consisting of an outer cylinder 15 and an inner cylinder 16 in the view finder is adjusted to adjust a position of the eyepiece section 13 in the forward/backward direction.



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CLAIMS

[Claim(s)]
[Claim 1] Image pck-up equipment characterized by adjusting the position of an eye contacting part by supporting the above-mentioned viewfinder and making this finder supporter material expand and contract by the finder supporter material made possible [adjusting to arbitrary length by expansion and contraction] in the image pck-up equipment which has the viewfinder with which regulation of the position of an eye contacting part was enabled.
[Claim 2] Finder supporter material is image pck-up equipment according to claim 1 characterized by forming the rotation supporting-point section in the other end while the finder connection section is formed in the end section, attaching the above-mentioned finder connection section in a viewfinder, and being attached in the means for supporting to which the rotation supporting-point section supports the whole image pck-up equipment.
[Claim 3] Finder supporter material is image pck-up equipment according to claim 2 characterized by being attached in parts other than the movable portion from which it is made for an angle to change in order to change the photography direction of the image pck-up equipment of means for supporting.
[Claim 4] Finder supporter material is image pck-up equipment according to claim 2 characterized by being attached free [rotation] to means for supporting also in the rotation supporting-point section while being attached free [rotation] to a viewfinder in the finder connection section.
[Claim 5] Finder supporter material is image pck-up equipment according to claim 3 characterized by being attached free [rotation] to means for supporting also in the rotation supporting-point section while being attached free [rotation] to a viewfinder in the finder connection section.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention relates to the image pck-up equipment it enabled it to hold possible [regulation of the position of the eye contacting part of a viewfinder].
[0002]
[Description of the Prior Art] It really [large-sized / camera] which is one of the image pck-up equipment used as business use sets to a type video tape recorder, especially a television station, etc. what is used as objects for coverage (ENG), such as news, (it is only called an "ENG camera" below —) The position of the eye contacting part of an operation system and a viewfinder, weight balance, etc. are designed so that it may be suitable for the busy condition of generally taking a photograph by supporting as it carries on a photography person's shoulder. For example, exactly, when an ENG camera is carried and supported on a shoulder, the eye contacting part of the view finder of an ENG camera is prepared in the front approach of an ENG camera so that it may come to the position of a photography person's eyes.
[0003] By the way, in such an ENG camera, since it is designed so that it may be carried, supported and used on a photography person's shoulder from the first as described above, when using it, fixing an ENG camera to a tripod etc., there is a problem that the position of the eye contacting part of a viewfinder does not suit a busy condition. That is, when using it, fixing an ENG camera to a tripod etc., an ENG camera must be set by the position of a photography person's eyes, an eye contacting part must be fixed to a quite high position for it, and it must look into an ye contacting part from the method of left-hand side.
[0004] Then, when the position of an eye contacting part is changed compared with the usual viewfinder so that it may be located more back, and it fixes to a tripod etc., the large-sized viewfinder which looks into an eye contacting part from the back of an ENG camera is used. Such a large-sized viewfinder is exchanged for the usual viewfind r, is attached in an ENG camera, or as it adds to the usual viewfinder, it is attached, and it extends an eye contacting part back. And if it is in such a large-sized viewfinder, since a lens, prism, etc. are built into the interior, a weight cannot be heavy, and it cannot become independent by itself. Therefore, such a large-sized viewfinder has the structure where it is supported from a lower part by the finder supporter material attached in the ENG camera.
[0005]
[Problem(s) to be Solved by the Invention] However, if it is in the ENG camera with which a large-sized viewfind r which was described above was attached Since the finder supporter material which supports a large-sized viewfinder is also attached in the ENG camera itself In the busy condition which fixed the ENG camera to the tripod, if the tilt of the ENG camera is carried out Synchronizing with change of this posture, a large-sized viewfinder also synchronizes with the finder supporter material which supports this, and the position moves it the upper part or caudad greatly. In order to double with movement of the position of the eye contacting part of a viewfinder, there was a problem that an extreme change of a photography person's photography posture would be forced. Since the posture change at the time of photography is large and it cannot perform photography of having sat on the safe chair for photography etc. in following, for example, taking a photograph on the crane for photography from a height, a photography person will break down balance and will be exposed to risk, such as a fall from the above-mentioned crane, by change of the posture accompanying photography.
[0006] Moreover, since the position of an eye contacting part was not able to be finely tuned at the time of the photography fixed to a fixed angle, depending on the case, the photography person might have to continue photography with the inconvenient posture.
[0007] Therefore, this invention image pck-up equipment makes it a technical problem to enable it to adjust the position of an eye contacting part fixed to change of the posture of the main part of image pck-up equipment related always to the optimal position.
[0008]
[Means for Solving the Problem] In order to solve the above-mentioned t chnical problem, a viewfinder is support d by the finder supporter material made for this invention image pck-up equipment to be adjusted to arbitrary length by expansion and contraction, and the position of an eye contacting part is adjusted by making this finder support r material expand and contract.
[0009] Therefor , the position of the eye contacting part of a viewfinder can be adjusted now so that it may b in the optimal state.
[0010]

[Embodiments of the Invention] Below, the gestalt of operation of this invention imag pck-up quipment is explained according to an example of the illustrat d operation. In addition, the following xamples apply this invention image pck-up equipment to the so-call d ENG camera used as objects for cov rage, such as news, in a television station etc.

[0011] In addition, when describing four directions and th direction of order in th following xplanation, in drawing 1, the direction of th as it is upper and lower sid s of th direction of up-and-down and a left shall b mad into th front, it shall make the method of the right back, and the dir ction of right and left at th tim f seeing an ENG camera from the above-mentioned back side to a front side shall be said about the direction of on either side.

[0012] The camera and VTR were unified and the image pck-up lens 3 projects [large-sized] the ENG camera 1 toward the front from this soma 2 of an abbreviation enclosed type. usually The shoulder pad section 4 formed in the lower part of this soma 2 is carried on a photography person's right shoulder, and is supported, and when both hands perform operation and support of a camera, the weight balance of the operation system, a viewfinder 5, and the whole etc. is set up so that it may be in the optimal state. In addition, the handle 6 for conveyance projects above this above-mentioned soma 2 up, and is formed in it, and the finder attachment section 8 is projected and formed in a microphone 7 and its left-hand side toward the front at the front end section of this handle 6. And when taking a photograph in the state where it described above, the eye contacting part 9 of a viewfinder 5 is in the state which is located in the right of a photography person's face and this shows to drawing 1 with a two-dot chain lin while being located in the left-hand side of this soma 2.

[0013] And in using it, fixing the ENG camera 1 to the universal head 11 of the tripod 10 which is the means for supporting which support the ENG camera 1 whole, since a photography person has to look into the eye contacting part 9 of a finder 5 with an inconvenient posture from the left-hand side of a tripod and photography cannot act as him easily, he exchanges and uses the standard viewfinder 5 for the large-sized long viewfinder (only henceforth a "viewfinder") 12. If a viewfinder 12 is attached in the finder attachment section 8 of the ENG camera 1, the eye contacting part 13 can be photoed by peeping into an eye contacting part 13 through the back of the ENG camera 1 fixed to the tripod 10, as it is extended more back than the eye contacting part 9 of the aforementioned viewfinder 5 and is shown in drawing 1. In addition, the portion which is attached in the inferior surface of tongue of this soma 2 of the ENG camera 1 which is the portion located in the upper part focusing on tilt supporting-point section 11a shown as a field which carried out the round shape all over drawing of a universal head 11 as shown in drawing 1 or drawing 3, and supports this carries out the tilt of the tripod 10 in the vertical direction, and the lower part of the above-mentioned tilt supporting-point section has become un-movable partial 11b.

[0014] The above-mentioned viewfinder 12 has long order length in order to extend the position of an eye contacting part 13 more back than the eye contacting part 9 of the standard finder 4, in the lens-barrel 14 to which a lens, prism, etc. carried out approximate circle tubed, is arranged suitably and changes. Furthermore, a lens-barrel 14 has the dual structure which consists of an outer case 15 and the container liner 16 attached in the back elastic state along the interior. And it can also adjust the position before and behind an eye contacting part 13 by expansion and contraction of the above-mentioned lens-barrel 14 while it is made possible to change an angle of a viewfinder 12 up and down focusing on the supporting-point section 17 which is the portion attached in the find r attachment section 8 of this soma 2, as shown in drawing 1.

[0015] By the way, as the viewfinder 12 was described above, it is suitably arranged in the long lens-barrel 14 to which a lens, prism, etc. carried out approximate circle tubed, and since a lens-barrel 14 changes from the elastic container liner 16 to an outer case 15 and back, compared with a viewfinder 5, it has a remarkable weight and remarkable size further. Therefore, a viewfinder 12 cannot support the whole only by the supporting-point section 17 of anterior part being attached in the finder attachment section 8 of this soma 2, but a posterior part supports it from a lower part by the finder supporter material 18.

[0016] A upper limit and a soffit are attached in a viewfinder 12 and a tripod 10, and the finder supporter material 18 is constituted by the main arm 19 and the rise-and-fall arm 20 which was supported inside this main arm 19 and made elastic up and down from the upper limit of the main arm 19, as main portions consist of a metal with lightweight aluminum etc. and it is shown in drawing 1 or drawing 3. And the stopper section 23 is formed in the approximate circle tubed rotation supporting-point section 21 projected to the method of the right at the soffit at the main arm 19, the rise-and-fall control unit 22 which sees from a left in the middle position which can be set up and down, and occupies the field of an abbreviation square, and the upper limit, respectively. Moreover, the finder connection section 24 is formed in the upper limit of the rise-and-fall arm 20 at one.

[0017] As the main arm 19 is shown in drawing 4, the long and slender Johan section 25 and the bottom half section 26 are prolonged toward the upper part and a lower part, respectively from the central rise-and-fall control unit 22. The case object 27 which the front wall of the this top half section 25, the bottom half section 26, and th ris -and-fall control unit 22, the posterior wall of stomach, and the right wall were formed in one, and carried out opening toward the left, the lids 28, 29, and 30 which carried out the abbreviation tabular fixed by proper methods, such as a scr w stop, in opening of the Johan section 25 of this cas object 27 and th bottom half section 26, and the ris -and-fall control unit 22 — ach — **** — it covers

[0018] namely, a guide in case the spac of th abbr viation prismatic prolonged up and down is form d when the case obj ct 27 is formed in the shap of an abbr viation channel in this portion and a lid 28 is attach d, and the ris -and-fall arm 20 moves up and down in this spac while the rise-and-fall arm 20 is contained as the Johan section 25 of the main arm 19 is shown in drawing 4 and drawing 6 — it functions as a hole 31 mor over, a guid in case th space of a rectangular abbreviation prismatic is formed when the case obj ct 27 is formed in the shape of

an abbreviation channel in this portion and a lid 29 is attached, and the rise-and-fall arm 20 moves up and down similarly in this spac whil the rise-and-fall arm 20 is contained as the bottom half s ction 26 is shown in drawing 4 and drawing 5 — it functions as a hol 32 in addition, a guide — the guide which th thickn ss of the wall befor and behind the case obj ct 27 is thicker than the thickness of th wall befor and behind the abov -m ntioned Johan section 25, and th hole 32 was carri d out, and carried out the rectangle in th Johan section 25 — to th configuration of a hol 31, only the diam ter of opening of ord r becom s short and has th opening configuration which succ ds in an abbr viation square

[0019] moreover, in the rise-and-fall control unit 22, order and right and left should be formed more greatly than the above-mentioned Johan section 25 and the bottom half section 26, and the size of the case object 27 should be reversed with another lid 33 with which opening of the method of the right carried out the abbreviation tabular while carrying out opening to right-and-left both directions and covering left opening with the lid 30 as mentioned abov to be shown in drawing 8 — ******

[0020] Furthermore, it is prolonged and arranged at the longitudinal direction in the state which the axis of rotation 37 supported by these while the building envelope was divided into the left room 35 and the right ventricle 36 and the case object 27 penetrated the lid 30 and the middle wall 34 in the center of the rise-and-fall control unit 22 by the septum 34 in the rise-and-fall control unit 22 can rotate freely. In addition, a right ventricle 36 has narrow width of face on either side compared with the left room 36, it is formed so that it may have the size whose depth of order is about about 2 times, and also in the back end corkscrew twist of the portion corresponding to the left room 36 in the back end wall of the case object 27 of the portion corresponding to the right ventricle 36, in connection with this, the amount of protrusions to back is large.

[0021] And the operation handle 38 is attached in the left end section which projected the axis of rotation 37 to the lid 30 shell exterior, the pinion gear 39 is fixed to the pars intermedia located in the left room 35, and the friction disc 40 is being fixed to the right end section located in a right ventricle 36. In addition, this friction disc 40 is made into the state where the friction pads 41 and 41 attached in the right face of a septum 34 were always contacted, and by friction with this friction-disc 40 front face and the front face of friction pads 41 and 41, unless the force more than fixed is applied to an operation handle 38, it rotates the axis of rotation 37. Moreover, the pinion gear 39 meshes with the rack formed in the bottom half section of the rise-and-fall arm 20 mentioned later.

[0022] Furthermore, in the stopper section 23 of the upper limit of the main arm 19, as shown in drawing 4 , outside attachment fixation of the cap object 42 made of synthetic resin is carried out at the upper-limit section of the case object 27 and a lid 28. This cap object 42 succeeds in the configuration which carried out the shape of an abbreviation rectangular pipe in which the upper limit was blockaded with the upper-limit wall 43, and the lower part carried out opening, and is being fixed to the main arm 19 by proper methods, such as a screw stop which the bottom half section 44 is attached outside the upper-limit section of the main arm 19, and does not illustrate. moreover, the cross-section configuration of the Johan section of the rise-and-fall arm 20 later mentioned in the center of the upper-limit wall 43 of the cap object 42 and abbreviation — the square hole 45 which has the same configuration and a diameter of opening is formed

[0023] Space is formed above the upper limit of the case object 27 and a lid 28 at the Johan section 46 of the cap object 42 with the peripheral wall and the upper-limit wall 43 of the cap object 42. And as shown in the cap object 42 at drawing 4 and drawing 9 , the guide shaft 47 was screwed focusing on the abbreviation for the Johan section 46, and the end (left end) projected on the left-hand side of the way outside the cap object 42, and has projected the other end to the inner direction of the cap object 42. moreover, the way outside the cap object 42 of the guid shaft 47 — a protrusion — while a control lever 48 is attached outside and fixed to the end section the bottom — the inner direction of the cap object 42 — a protrusion — the bottom — the other end — a stopper — the member 49 is being attached outside and fixed therefore, from the position which shows a control lever 48 to drawing 9 , it sees from a left and rotates about 45 degrees in the direction of a counterclockwise rotation — making (position of the control lever 48 shown in drawing 1 or drawing 3) — The guide shaft 47 whole currently screwed in the cap object 42 displaces to the left slightly. a stopper — the direction [in / drawing 9 / in a member 49] of an arrow (left) — moving — the rise-and-fall arm 20 — being stuck by pressure — the rise-and-fall arm 20 at this time, and a stopper — the position of the rise-and-fall arm 20 can be fixed now to a its present location with frictional forc with a member 49 In addition, it prevents that screwing with the cap object 42 and the guide shaft 47 separates by laying a stopper pin 50 under the cap object 42, contacting the rib 51 of a control lever 48, if a part projects to th left and carries out fixed angle rotation of the control lever 48, and rotating a control lever 48 more than required.

[0024] As the rise-and-fall arm 20 is shown in drawing 4 , compared with the Johan section 52 and the this top half section 52, only the width of face of order changes from the bottom half section 53 made thin to an abbreviation half grade. to the upper limit of the Johan section 52 a center — a screw — while the finder connection section 24 which has a hole and carried out the shape of a disk of ****** is formed in one, the long hole 54 prolonged up and down is formed, and the rack 55 is formed in the back end of the bottom half section 53 moreover, boundary section 52a of the above-mentioned Johan section 52 and the bottom half section 53 — the outer diameter of the Johan section 52 — mist — it is made thick, and it is formed in the shape of ****, and suppose that it is almost the same as th bore of the Johan section 25 of the main arm 19 — having — the guide of the main arm 19 — th insid of the Johan section 25 which is a hole 31 is contacted, and rise-and-fall operation of th rise-and-fall arm 20 is guided

[0025] And the ris -and-fall arm 20 is arrang d in the stat where it is shown in drawing 4 , to the main arm 19. That is, in the long hole 54 of the Johan section 50, the guide shaft 47 of the stopper section 23 is located, with

rise-and-fall operation of th ris -and-fall arm 20, the guide shaft 47 slides on th inside of a long hol 54 relatively, and rise-and-fall operation f the rise-and-fall arm 20 is guided by this. Mor over, the rack 55 f the bottom half section 53 has geared with th pinion g ar 39 in the rise-and-fall control unit 22 of th main arm 19. Therefore, if the rise-and-fall arm 20 rotates the op ration handle 38, rotation of the pinion gear 39 will b changed into a vertical motion by th rack 55 which geared with this. The upper part or caudad on th whole, th ris -and-fall arm 20 moves according to th hand of cut of the operation handle 38, the Johan section 52 of the rise-and-fall arm 20 is sent out or return d from the squar hol 45 of the cap object 42 of the main arm 19, and the length f the finder supporter material 18 whole changes.

[0026] While a screw stop is carried out to the stop ring 56 which was attached outside the back end section of the container liner 16 of a viewfinder 12, and was fixed as the finder connection section 24 of the rise-and-fall arm 20 was shown in drawing 1 or drawing 3 , it is attached free [rotation], and the rise-and-fall arm 20 uses the finder connection section 24 as the rotation supporting point to a container liner 16 by this, and it comes to carry out rotation free.

[0027] Furthermore, as mentioned above, the rotation supporting-point section 21 is formed in the position of the ****** approach of the soffit section of the main arm 19. That is, the rotation supporting-point section 21 is inner-**(ed) by the support cylinder 57 which succeeds in the approximate circle tubed which carried out opening to both right and left while being projected and formed in one toward the method of the right from the position of the front approach of the soffit section of the case object 27, as shown in drawing 7 , and this support cylinder 57, and it consists of the support shaft 58 grade supported in the state where the finder supporter material 18 whole can be rotated freely.

[0028] The support shaft 58 is being fixed to the tripod 10 by the right end's penetrating from a left the back end of the support plate 59 by which the front end was fixed to the back end of non-moving-part 11b of the universal head 11 of a tripod 10, and screwing a nut 60 from the method of the right. And bearings 61 and 61 are inner-**(ed) by ****** 57, the support shaft 58 is inner-**(ed) from the method of the right to the bearings 61 and 61 in the support cylinder 57, and it screws and escapes from the fixed nut 62 in the left end section of the support shaft 58 projected from the left end of the support cylinder 57 to the left, and succeeds in a stop. The finder supporter material 18 comes to be supported free [rotation of the soffit section] by this while being fixed to a tripod 10 through a support plate 59.

[0029] Thus, since the soffit section is attached in non-moving-part 11b of a universal head 11 in the rotation supporting-point section 21, without attaching in this soma 2 of the ENG camera 1, the finder supporter material 18 Only by the variation rate of the position by the posture change accompanying tilt operation of the ENG camera 1 at the time of photography being transmitted to the finder supporter material 18 from the finder connection section 24 of the upper part of the finder supporter material 18 Since it dissociates with the movement of the movable portion of the universal head 11 of a tripod 10, it moves finder supporter material 18, and the position of the rotation supporting-point section 21 serves as only rotation centering on the rotation supporting-point section 21 of **, without moving, and makes the minimum movement of the position of the eye contacting part 13 of a viewfinder 12.

[0030] therefore, when carrying out a tilt so that it may be in the state where the image pck-up lens 3 shown in drawing 2 or drawing 3 turns to the upper part or a lower part from the level state which the tilt feature of the universal head 11 of a tripod 10 is operated, and shows the ENG camera 1 whole in drawing 1 Posture change of th ENG camera 1 gets across to the finder supporter material 18 through a viewfinder 12 and the finder connection section 24, and the finder supporter material 18 is rotated by the front or back focusing on the rotation supporting-point section 21. or [and / that it passes the position of the eye contacting part 13 of the viewfinder 12 at this tim the bottom for a photography person to look in] — or for passing a top and continuing photography as it is, it is inconvenient Then, if the length of the finder supporter material 18 whole is adjusted by operating the operation handle 38, rotating this and making the rise-and-fall arm 20 expand and contract up and down and the position of the finder connection section 24 is changed up and down, a viewfinder 12 can be in the optimal state for the upp r part or peeping into the back of the ENG camera 1 to the eye contacting part 13, since it rotates caudad focusing on the supporting-point section 12. Moreover, adjustment of the position of the eye contacting part 13 in a cross direction is also possible by making regulation the length of the lens-barrel 14 which consists of the outer case 15 and container liner 16 of a viewfinder 12.

[0031] Moreover, as mentioned above, the rise-and-fall arm 20 will be rotated if the axis of rotation 37 which fixed the pinion gear 39 does not apply the force more than fixed as mentioned above with the frictional resistance between a friction disc 40 and friction pads 41 and 41. For this reason, it is possible to fine-adjust and double th position where the height of the position of an eye contacting part 13 is delicate only with the weight of the viewfinder 12 then connected with the rise-and-fall arm 20 and this, since rise and fall of the rise-and-fall arm 20 can be stopped immediately in the positions where 20's is usually arbitrary when it operates the operation handl 38 since a rise-and-fall arm does not descend, and it makes the rise-and-fall arm 20 go up and down.

[0032] furthermore, the stopper in the stopper section 23 — it is possible by using together sticking by pressure to the rise-and-fall arm 20 of a member 49 to maintain the position of the ris -and-fall arm 20 in the present condition more firmly

[0033]

[Effect of the Invention] So that clearly from the place indicated above this invention image pck-up equipment The above-mentioned viewfinder is support d by the finder supp rter material mad for a thing according t claim 1 to be adjusted to arbitrary length by xpansion and contraction. Since the position of an eye contacting part was

adjust d by making find r support r mat rial expand and contract, when using it, fixing image pck-up quipm nt to means for supporting, such as a tripod, regardl ss of the posture of image pck-up equipment, an eye contacting part can b adjusted so that it may com to th optimal position.

[0034] Moreover, it is hard finder supporter material coming to receive, since finder supp rt r mat rial forms the rotation supporting-point section in the other end, attach s the finder connection section in a viewfinder and attached the rotation supporting-point section in th means for supporting which support the whol imag pck-up equipment whil it form d the find r conn ction s ction in the end section if it was in invention indicated to the claim 2 in the influence by posture change of image pck-up equipment.

[0035] Furthermore, if it is in invention indicated to the claim 3, since finder supporter material was attached in parts other than the movable portion from which it is made for an angle to change in order to change the photography direction of the image pck-up equipment of means for supporting, finder supporter material is not influenced accompanying the movement of the moving part of means for supporting.

[0036] Furthermore, if it is in invention indicated to the claim 4 and the claim 5 again While attaching finder supporter material free [rotation] to a viewfinder in the finder connection section Since it was made to attach fre [rotation] to means for supporting also in the rotation supporting-point section, when image pck-up equipment changes the posture at the time of photography, finder supporter material does not have a bad influence on operation to which the posture is changed.

[0037] In addition, it does not pass over the concrete configuration and concrete structure which were shown in th aforementioned example to what showed a mere example of the embodiment which hits carrying out this invention, and the technical range of this invention is not interpreted by these in limitation.

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TECHNICAL FIELD

[The technical field to which invention belongs] this invention relates to the image pck-up equipment it enabled it to hold possible [regulation of the position of the eye contacting part of a viewfinder].

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PRIOR ART

[Description of the Prior Art] It really [large-sized / camera] which is one of the image pck-up equipment used as business use sets to a type video tape recorder, especially a television station, etc., and is objects for coverage (ENG), such as news. The position of the eye contacting part of an operation system and a viewfinder, weight balance, etc. are designed so that what is used (only henceforth an "ENG camera") may be suitable for the busy condition of taking a photograph by supporting as it generally carries on a photography person's shoulder. For example, exactly, when an ENG camera is carried and supported on a shoulder, the eye contacting part of the view finder of an ENG camera is prepared in the front approach of an ENG camera so that it may come to the position of a photography person's eyes.
[0003] By the way, in such an ENG camera, since it is designed so that it may be carried, supported and used on a photography person's shoulder from the first as described above, when using it, fixing an ENG camera to a tripod etc., there is a problem that the position of the eye contacting part of a viewfinder does not suit a busy condition. That is, when using it, fixing an ENG camera to a tripod etc., an ENG camera must be set by the position of a photography person's eyes, an eye contacting part must be fixed to a quite high position for it, and it must look into an eye contacting part from the method of left-hand side.
[0004] Then, when the position of an eye contacting part is changed compared with the usual viewfinder so that it may be located more back, and it fixes to a tripod etc., the large-sized viewfinder which looks into an eye contacting part from the back of an ENG camera is used. Such a large-sized viewfinder is exchanged for the usual viewfinder, is attached in an ENG camera, or as it adds to the usual viewfinder, it is attached, and it extends an eye contacting part back. And if it is in such a large-sized viewfinder, since a lens, prism, etc. are built into the interior, a weight cannot be heavy, and it cannot become independent by itself. Therefore, such a large-sized viewfinder has the structure where it is supported from a lower part by the finder supporter material attached in the ENG camera.

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EFFECT OF THE INVENTION

[Effect of the Invention] It is this invention image pck-up equipment so that clearly from the place indicated above. Since the thing according to claim 1 adjusted the position of an eye contacting part by supporting the above-mentioned viewfinder and making finder supporter material expand and contract by the finder supporter material made possible [adjusting to arbitrary length by expansion and contraction], when fixing and using image pck-up equipment for means for supporting, such as a tripod, it can adjust an eye contacting part regardless of the postur of image pck-up equipment so that it may come to the optimal position.
[0034] Moreover, it is hard finder supporter material coming to receive, since finder supporter material forms th rotation supporting-point section in the other end, attaches the finder connection section in a viewfinder and attached the rotation supporting-point section in the means for supporting which support the whole image pck-up equipment while it formed the finder connection section in the end section if it was in invention indicated to the claim 2 in the influence by posture change of image pck-up equipment.
[0035] Furthermore, if it is in invention indicated to the claim 3, since finder supporter material was attached in parts other than the movable portion from which it is made for an angle to change in order to change the photography direction of the image pck-up equipment of means for supporting, finder supporter material is not influenced accompanying the movement of the moving part of means for supporting.
[0036] Furthermore, it is if it is in invention indicated to the claim 4 and the claim 5 again. Since finder supporter material was attached free [rotation] to means for supporting also in the rotation supporting-point section while attaching it free [rotation] to the viewfinder in the finder connection section, when image pck-up equipment changes the posture at the time of photography, finder supporter material does not have a bad influence on operation to which the posture is changed.
[0037] In addition, it does not pass over the concrete configuration and concrete structure which were shown in the aforementioned example to what showed a mere example of the embodiment which hits carrying out this invention, and the technical range of this invention is not interpreted by these in limitation.

[Translation done.]

* NOTICES *

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, if it is in the ENG camera with which a large-sized viewfinder which was described above was attached Since the finder supporter material which supports a large-sized viewfinder is also attached in the ENG camera itself In the busy condition which fixed the ENG camera to the tripod, if the tilt of the ENG camera is carried out Synchronizing with change of this posture, a large-sized viewfinder also synchronizes with the finder supporter material which supports this, and the position moves it to the upper part or a lower part greatly. In order to double with movement of the position of the eye contacting part of a viewfinder, there was a problem that an extreme change of a photography person's photography posture would be forced. Since the posture change at the time of photography is large and it cannot perform photography of having sat on the safe chair for photography etc. in following, for example, taking a photograph on the crane for photography from a height, a photography person will break down balance and will be exposed to risk, such as a fall from the above-mentioned crane, by change of the posture accompanying photography.
[0006] Moreover, since the position of an eye contacting part was not able to be finely tuned at the time of the photography fixed to a fixed angle, depending on the case, the photography person might have to continue photography with the inconvenient posture.
[0007] Therefore, this invention image pck-up equipment makes it a technical problem to enable it to adjust the position of an eye contacting part fixed to change of the posture of the main part of image pck-up equipment related always to the optimal position.

[Translation done.]

MEANS

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, a viewfinder is supported by the finder supporter material made for this invention image pck-up equipment to be adjusted to arbitrary length by xpansion and contraction, and the position of an eye contacting part is adjusted by making this finder supporter material expand and contract.

[0009] Therefore, the position of the eye contacting part of a viewfinder can be adjusted now so that it may be in the optimal state.

[0010]

[Embodiments of the Invention] Below, the gestalt of operation of this invention image pck-up equipment is explained according to an example of the illustrated operation. In addition, the following examples apply this invention image pck-up equipment to the so-called ENG camera used as objects for coverage, such as news, in a television station etc.

[0011] In addition, when describing four directions and the direction of order in the following explanation, in drawing 1 , the direction of the as it is upper and lower sides of the direction of up-and-down and a left shall be made into the front, it shall make the method of the right back, and the direction of right and left at the time of seeing an ENG camera from the above-mentioned back side to a front side shall be said about the direction of on either side.

[0012] The camera and VTR were unified and the image pck-up lens 3 projects [large-sized] the ENG camera 1 toward the front from this soma 2 of an abbreviation enclosed type. usually The shoulder pad section 4 formed in the lower part of this soma 2 is carried on a photography person's right shoulder, and is supported, and when both hands perform operation and support of a camera, the weight balance of the operation system, a viewfinder 5, and the whole etc. is set up so that it may be in the optimal state. In addition, the handle 6 for conveyance projects above this above-mentioned soma 2 up, and is formed in it, and the finder attachment section 8 is projected and formed in a microphone 7 and its left-hand side toward the front at the front end section of this handle 6. And when taking a photograph in the state where it described above, the eye contacting part 9 of a viewfinder 5 is in the state which is located in the right of a photography person's face and this shows to drawing 1 with a two-dot chain line while being located in the left-hand side of this soma 2.

[0013] And in using it, fixing the ENG camera 1 to the universal head 11 of the tripod 10 which is the means for supporting which support the ENG camera 1 whole, since a photography person has to look into the eye contacting part 9 of a finder 5 with an inconvenient posture from the left-hand side of a tripod and photography cannot act as him easily, he exchanges and uses the standard viewfinder 5 for the large-sized long viewfinder (only henceforth a "vi wfinder") 12. If a viewfinder 12 is attached in the finder attachment section 8 of the ENG camera 1, the ey contacting part 13 can be photoed by peeping into an eye contacting part 13 through the back of the ENG camera 1 fixed to the tripod 10, as it is extended more back than the eye contacting part 9 of the aforementioned viewfind r 5 and is shown in drawing 1 . In addition, the portion which is attached in the inferior surface of tongue of this soma 2 of the ENG camera 1 which is the portion located in the upper part focusing on tilt supporting-point section 11a shown as a field which carried out the round shape all over drawing of a universal head 11 as shown in drawing 1 or drawing 3 , and supports this carries out the tilt of the tripod 10 in the vertical direction, and the lower part of th above-mentioned tilt supporting-point section has become un-movable partial 11b.

[0014] The above-mentioned viewfinder 12 has long order length in order to extend the position of an eye contacting part 13 more back than the eye contacting part 9 of the standard finder 4, in the lens-barrel 14 to which a lens, prism, etc. carried out approximate circle tubed, is arranged suitably and changes. Furthermore, a lens-barrel 14 has the dual structure which consists of an outer case 15 and the container liner 16 attached in the back elastic state along the interior. And it can also adjust the position before and behind an eye contacting part 13 by expansion and contraction of the above-mentioned lens-barrel 14 while it is made possible to change an angle of a viewfinder 12 up and down focusing on the supporting-point section 17 which is the portion attached in the finder attachment section 8 of this soma 2, as shown in drawing 1 .

[0015] By the way, as th viewfinder 12 was described above, it is suitably arrang d in th long lens-barrel 14 to which a lens, prism, etc. carri d out approximat circl tubed, and since a l ns-barrel 14 changes fr m the elastic container liner 16 to an outer case 15 and back, compared with a viewfinder 5, it has a r markable w ight and remarkable size further. Ther for , a viewfinder 12 cannot support the whol only by the supporting-point section 17 of anterior part being attached in the find r attachment section 8 of this soma 2, but a posterior part supports it from a lower part by the finder supporter material 18.

[0016] A upper limit and a soffit are attached in a viewfinder 12 and a tripod 10, and the find r supporter mat rial 18

is constituted by the main arm 19 and th rise-and-fall arm 20 which was supported insid this main arm 19 and made elastic up and down from th upper limit of the main arm 19, as main portions consist of a metal with lightweight aluminum tc. and it is shown in drawing 1 or drawing 3 . And the stopper section 23 is form d in the approximate circle tub d rotati n supporting-point section 21 proj cted to the method of th right at the soffit at th main arm 19, the ris -and-fall control unit 22 which sees from a left in the middle position which can b set up and down, and occupi s th field of an abbreviation square, and th upper limit, respectively. Moreover, the finder connection s ction 24 is formed in the upper limit of th ris -and-fall arm 20 at on .

[0017] As the main arm 19 is shown in drawing 4 , the long and slender Johan section 25 and the bottom half section 26 are prolonged toward the upper part and a lower part, respectively from the central rise-and-fall control unit 22. The case object 27 which the front wall of the this top half section 25, the bottom half section 26, and th ris -and-fall control unit 22, the posterior wall of stomach, and the right wall were formed in one, and carried out opening toward the left, the lids 28, 29, and 30 which carried out the abbreviation tabular fixed by proper methods, such as a screw stop, in opening of the Johan section 25 of this case object 27 and the bottom half section 26, and the rise-and-fall control unit 22 — each — **** — it covers

[0018] namely, a guide in case the space of the abbreviation prismatic prolonged up and down is formed when the case object 27 is formed in the shape of an abbreviation channel in this portion and a lid 28 is attached, and the rise-and-fall arm 20 moves up and down in this space while the rise-and-fall arm 20 is contained as the Johan section 25 of the main arm 19 is shown in drawing 4 and drawing 6 — it functions as a hole 31 moreover, a guid in case the space of a rectangular abbreviation prismatic is formed when the case object 27 is formed in the shap f an abbreviation channel in this portion and a lid 29 is attached, and the rise-and-fall arm 20 moves up and down similarly in this space while the rise-and-fall arm 20 is contained as the bottom half section 26 is shown in drawing 4 and drawing 5 — it functions as a hole 32 in addition, a guide — the guide which the thickness of the wall befor and behind the case object 27 is thicker than the thickness of the wall before and behind the above-mentioned Johan section 25, and the hole 32 was carried out, and carried out the rectangle in the Johan section 25 — to th configuration of a hole 31, only the diameter of opening of order becomes short and has the opening configuration which succeeds in an abbreviation square

[0019] moreover, in the rise-and-fall control unit 22, order and right and left should be formed more greatly than th above-mentioned Johan section 25 and the bottom half section 26, and the size of the case object 27 should be reversed with another lid 33 with which opening of the method of the right carried out the abbreviation tabular while carrying out opening to right-and-left both directions and covering left opening with the lid 30 as mentioned abov to be shown in drawing 8 — ******

[0020] Furthermore, it is prolonged and arranged at the longitudinal direction in the state which the axis of rotation 37 supported by these while the building envelope was divided into the left room 35 and the right ventricle 36 and the case object 27 penetrated the lid 30 and the middle wall 34 in the center of the rise-and-fall control unit 22 by the septum 34 in the rise-and-fall control unit 22 can rotate freely. In addition, a right ventricle 36 has narrow width of face on either side compared with the left room 36, it is formed so that it may have the size whose depth of order is about about 2 times, and also in the back end corkscrew twist of the portion corresponding to the left room 36 in the back end wall of the case object 27 of the portion corresponding to the right ventricle 36, in connection with this, the amount of protrusions to back is large.

[0021] And the operation handle 38 is attached in the left end section which projected the axis of rotation 37 to the lid 30 shell exterior, the pinion gear 39 is fixed to the pars intermedia located in the left room 35, and the friction disc 40 is being fixed to the right end section located in a right ventricle 36. In addition, this friction disc 40 is made into the state where the friction pads 41 and 41 attached in the right face of a septum 34 were always contacted, and by friction with this friction-disc 40 front face and the front face of friction pads 41 and 41, unless the force more than fixed is applied to an operation handle 38, it rotates the axis of rotation 37. Moreover, the pinion gear 39 meshes with the rack formed in the bottom half section of the rise-and-fall arm 20 mentioned later.

[0022] Furthermore, in the stopper section 23 of the upper limit of the main arm 19, as shown in drawing 4 , outside attachment fixation of the cap object 42 made of synthetic resin is carried out at the upper-limit section of the case object 27 and a lid 28. This cap object 42 succeeds in the configuration which carried out the shape of an abbreviation rectangular pipe in which the upper limit was blockaded with the upper-limit wall 43, and the lower part carried out opening, and is being fixed to the main arm 19 by proper methods, such as a screw stop which the bottom half section 44 is attached outside the upper-limit section of the main arm 19, and does not illustrate. moreover, the cross-section configuration of the Johan section of the rise-and-fall arm 20 later mentioned in the center of the upper-limit wall 43 of the cap object 42 and abbreviation — the square hole 45 which has the sam configuration and a diameter of opening is formed

[0023] Space is formed above the upper limit of the case object 27 and a lid 28 at the Johan section 46 of the cap object 42 with the peripheral wall and the upper-limit wall 43 of the cap object 42. And as shown in the cap object 42 at drawing 4 and drawing 9 , the guid shaft 47 was scr w d focusing on the abbreviation for th Johan s ction 46, and the end (left end) project d on the left-hand side of th way outsid the cap obj ct 42, and has project d the other end to the inner direction of the cap object 42. moreov r, th way outside the cap object 42 of th guid shaft 47 — a protrusion — while a control lever 48 is attached outside and fixed to the end section th bottom — the inner direction of the cap object 42 — a protrusion — the bottom — th other end — a stopper — the member 49 is being attached outside and fixed therefor , from the position which shows a control lev r 48 to drawing 9 , it sees from a left and rotates about 45 degrees in the direction of a counterclockwise rotation — making (position of

the control lever 48 shown in drawing 1 or drawing 3) — The guide shaft 47 whole currently scr wed in th cap object 42 displaces to the left slightly. a stopper — the direction [in / drawing 9 / in a m mber 49] f an arr w (left) — moving — the rise-and-fall arm 20 — being stuck by pressure — th rise-and-fall arm 20 at this tim , and a stopper — the position of th rise-and-fall arm 20 can be fixed now t a its pr sent l cation with frictional force with a member 49 In addition, it prevents that screwing with the cap object 42 and th guide shaft 47 s parates by laying a stopper pin 50 under the cap object 42, contacting th rib 51 f a control l ver 48, if a part projects to the left and carries out fix d angle rotation of the control lever 48, and rotating a control lever 48 mor than r quir d.

[0024] As the rise-and-fall arm 20 is shown in drawing 4 , compared with the Johan section 52 and the this top half section 52, only the width of face of order changes from the bottom half section 53 made thin to an abbreviation half grade. to the upper limit of the Johan section 52 a center — a screw — while the finder connection section 24 which has a hole and carried out the shape of a disk of ****** is formed in one, the long hole 54 prolonged up and down is formed, and the rack 55 is formed in the back end of the bottom half section 53 moreover, boundary section 52a of the above-mentioned Johan section 52 and the bottom half section 53 — the outer diameter of the Johan section 52 — mist — it is made thick, and it is formed in the shape of ****, and suppose that it is almost the sam as the bore of the Johan section 25 of the main arm 19 — having — the guide of the main arm 19 — the inside of the Johan section 25 which is a hole 31 is contacted, and rise-and-fall operation of the rise-and-fall arm 20 is guided

[0025] And the rise-and-fall arm 20 is arranged in the state where it is shown in drawing 4 , to the main arm 19. That is, in the long hole 54 of the Johan section 50, the guide shaft 47 of the stopper section 23 is located, with rise-and-fall operation of the rise-and-fall arm 20, the guide shaft 47 slides on the inside of a long hole 54 relativ ly, and rise-and-fall operation of the rise-and-fall arm 20 is guided by this. Moreover, the rack 55 of the bottom half section 53 has geared with the pinion gear 39 in the rise-and-fall control unit 22 of the main arm 19. Therefore, if the rise-and-fall arm 20 rotates the operation handle 38, rotation of the pinion gear 39 will be changed into a vertical motion by the rack 55 which geared with this. The upper part or caudad on the whole, the rise-and-fall arm 20 moves according to the hand of cut of the operation handle 38, the Johan section 52 of the rise-and-fall arm 20 is sent out or returned from the square hole 45 of the cap object 42 of the main arm 19, and the length of the finder supporter material 18 whole changes.

[0026] While a screw stop is carried out to the stop ring 56 which was attached outside the back end section of th container liner 16 of a viewfinder 12, and was fixed as the finder connection section 24 of the rise-and-fall arm 20 was shown in drawing 1 or drawing 3 , it is attached free [rotation], and the rise-and-fall arm 20 uses the finder connection section 24 as the rotation supporting point to a container liner 16 by this, and it comes to carry out rotation free.

[0027] Furthermore, as mentioned above, the rotation supporting-point section 21 is formed in the position of the ****** approach of the soffit section of the main arm 19. That is, the rotation supporting-point section 21 is inner-**(ed) by the support cylinder 57 which succeeds in the approximate circle tubed which carried out opening to both right and left while being projected and formed in one toward the method of the right from the position of the front approach of the soffit section of the case object 27, as shown in drawing 7 , and this support cylinder 57, and it consists of the support shaft 58 grade supported in the state where the finder supporter material 18 whole can b rotated freely.

[0028] The support shaft 58 is being fixed to the tripod 10 by the right end's penetrating from a left the back end of the support plate 59 by which the front end was fixed to the back end of non-moving-part 11b of the universal head 11 of a tripod 10, and screwing a nut 60 from the method of the right. And bearings 61 and 61 are inner-**(ed) by ****** 57, the support shaft 58 is inner-**(ed) from the method of the right to the bearings 61 and 61 in the support cylinder 57, and it screws and escapes from the fixed nut 62 in the left end section of the support shaft 58 projected from the left end of the support cylinder 57 to the left, and succeeds in a stop. The finder supporter material 18 comes to be supported free [rotation of the soffit section] by this while being fixed to a tripod 10 through a support plate 59.

[0029] Thus, since the soffit section is attached in non-moving-part 11b of a universal head 11 in the rotation supporting-point section 21, without attaching in this soma 2 of the ENG camera 1, the finder supporter material 18 Only by the variation rate of the position by the posture change accompanying tilt operation of the ENG camera 1 at the time of photography being transmitted to the finder supporter material 18 from the finder connection section 24 of the upper part of the finder supporter material 18 Since it dissociates with the movement of the movable portion of the universal head 11 of a tripod 10, it moves finder supporter material 18, and the position of the rotation supporting-point section 21 serves as only rotation centering on the rotation supporting-point section 21 of **, without moving, and makes the minimum movement of the position of the eye contacting part 13 of a viewfinder 12.

[0030] therefore, when carrying out a tilt so that it may be in the state where the image pck-up lens 3 shown in drawing 2 or drawing 3 turns to the upper part or a lower part from the level state which the tilt feature of the universal head 11 of a tripod 10 is operated, and shows the ENG camera 1 whole in drawing 1 Posture change of the ENG camera 1 gets across to the finder supporter material 18 through a vi wfinder 12 and the find r connection section 24, and the finder supporter material 18 is rotated by th front or back focusing on the rotation supporting-point section 21. or [and / that it passes the position of the ey contacting part 13 of the viewfinder 12 at this time the bottom for a photography person to look in] — or for passing a top and continuing photography as it is, it is inconvenient Then, if the length of th finder support r material 18 whol is adjusted by operating th op ration handl 38, rotating this and making the rise-and-fall arm 20 expand and contract up and down and the position of

th finder conn ction section 24 is chang d up and down, a viewfinder 12 can b in the optimal stat for the upper part or p eping into the back of the ENG camera 1 to the eye contacting part 13, sinc it rotat s caudad focusing on the supporting-point s ction 12. Moreov r, adjustment of the position of th ey contacting part 13 in a cross dir ction is also possible by making regulation the length of th lens-barrel 14 which consists of th outer case 15 and container liner 16 of a vi wfinder 12.

[0031] Mor over, as mentioned abov , the ris -and-fall arm 20 will be rotated if th axis of rotation 37 which fixed th pinion gear 39 does not apply the force m r than fixed as mentioned above with th frictional resistanc between a friction disc 40 and friction pads 41 and 41. For this reason, it is possible to fine-adjust and double th position where the height of the position of an eye contacting part 13 is delicate only with the weight of the viewfinder 12 then connected with the rise-and-fall arm 20 and this, since rise and fall of the rise-and-fall arm 20 can be stopped immediately in the positions where 20's is usually arbitrary when it operates the operation handl 38 since a rise-and-fall arm does not descend, and it makes the rise-and-fall arm 20 go up and down.

[0032] furthermore, the stopper in the stopper section 23 — it is possible by using together sticking by pressure to th rise-and-fall arm 20 of a member 49 to maintain the position of the rise-and-fall arm 20 in the present condition more firmly

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[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the side elevation showing the state of using it, attaching this invention image pck-up equipment in a tripod.
[Drawing 2] It is the side elevation showing the state when carrying out the tilt of the image pck-up equipment caudad.
[Drawing 3] It is the side elevation showing the state at the time of making the upper part carry out the tilt of th image pck-up equipment.
[Drawing 4] It is drawing of longitudinal section expanding and showing finder supporter material.
[Drawing 5] It is the expanded sectional view which meets the V-V line in drawing 4 .
[Drawing 6] It is the expanded sectional view which meets the VI-VI line in drawing 4 .
[Drawing 7] It is the expanded sectional view which meets the VII-VII line in drawing 4 .
[Drawing 8] It is the expanded sectional view which meets the VIII-VIII line in drawing 4 .
[Drawing 9] It is the expanded sectional view which meets the IX-IX line in drawing 4 .
[Description of Notations]
1 [— An eye contacting part, 18 / — Finder supporter material, 21 / — The rotation supporting-point section, 24 / — Finder connection section] — Image pck-up equipment, 12 — A viewfinder, 13

[Translation done.]

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2.**** shows th word which can not b translated.
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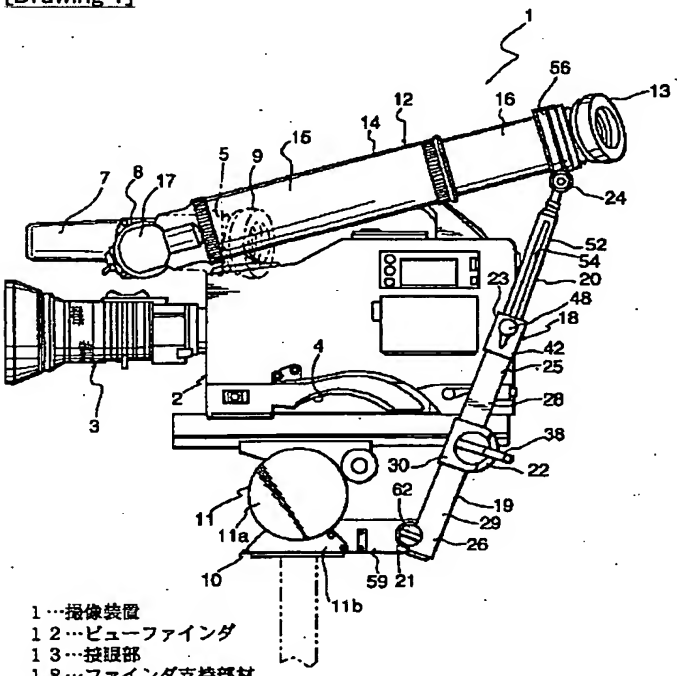
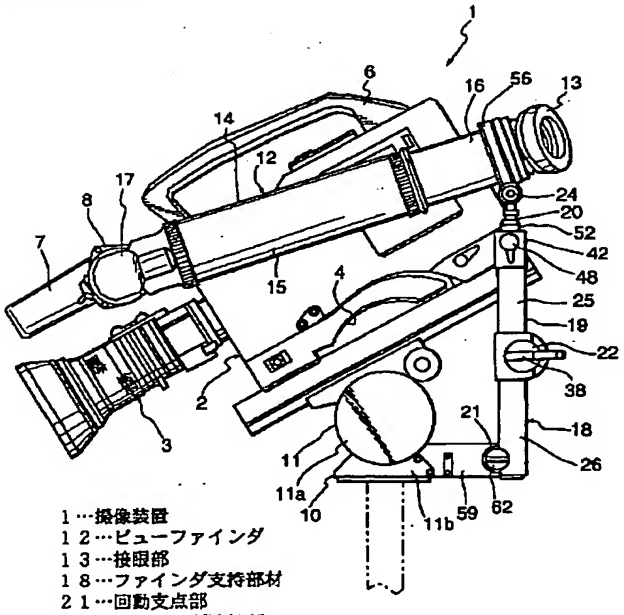
DRAWINGS

[Drawing 1]



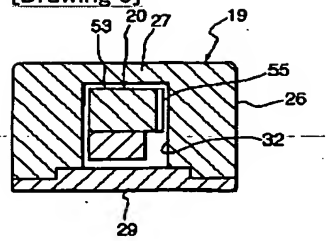
1…撮像装置
12…ビューファインダ
13…接眼部
18…ファインダ支持部材
21…回動支点部
24…ファインダ連結部

[Drawing 3]

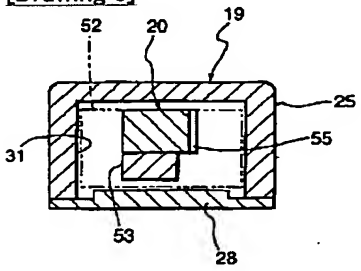


1…撮像装置
12…ビューファインダ
13…接眼部
18…ファインダ支持部材
21…回動支点部
24…ファインダ連結部

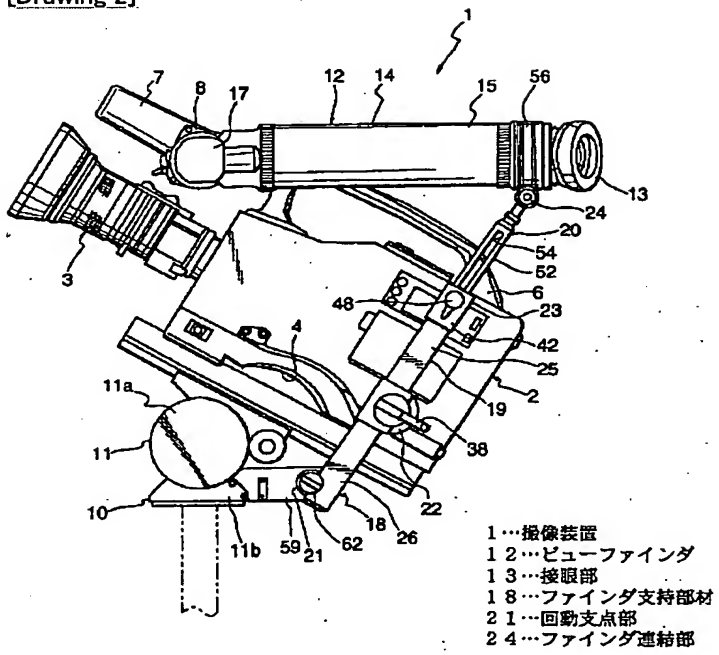
[Drawing 5]



[Drawing 6]

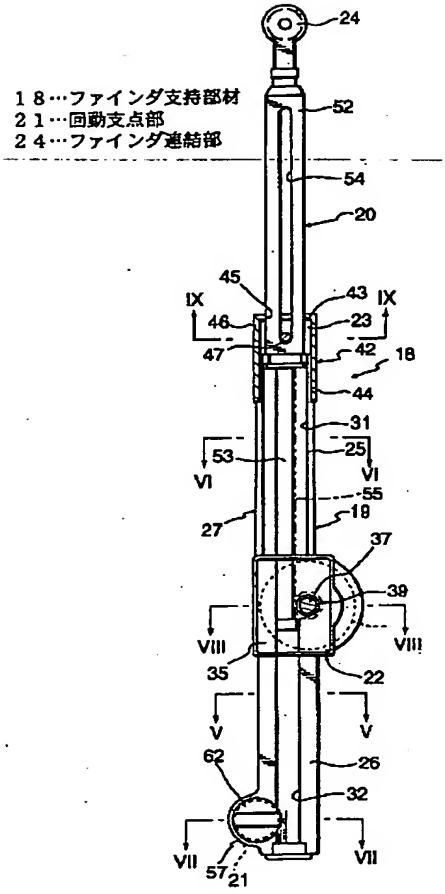


[Drawing 2]

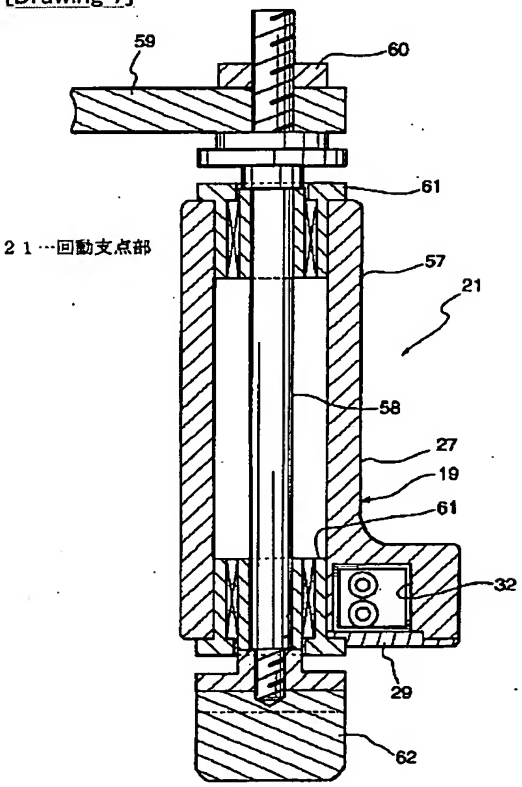


1…撮像装置
12…ビューファインダ
13…接眼部
18…ファインダ支持部材
21…回動支点部
24…ファインダ連結部

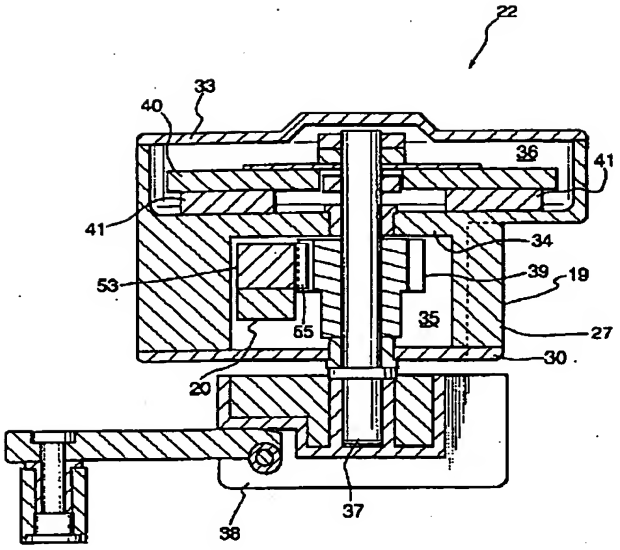
[Drawing 4]



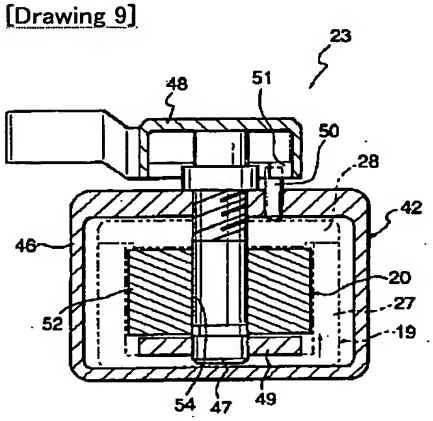
[Drawing 7]



[Drawing 8]



[Drawing 9]



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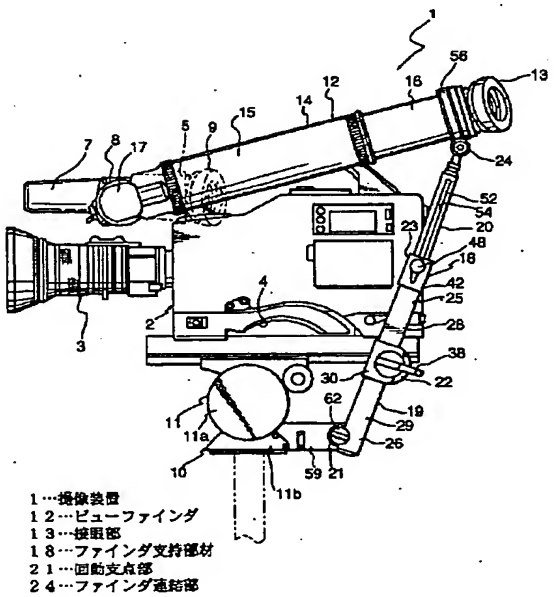
(54)【発明の名称】　撮像装置

(57)【要約】

【課題】　撮像装置において、ビューファインダの接眼部の位置を調節可能に保持することができるようにする。

【解決手段】　伸縮によって任意の長さに調整することが可能とされたファインダ支持部材１８によってビューファインダ１２を支持し、ファインダ支持部材を伸縮させることによって接眼部１３の位置を調節するようにした。



【特許請求の範囲】
【請求項１】　接眼部の位置が調節自在とされたビューファインダを有する撮像装置において、
伸縮によって任意の長さに調整することが可能とされたファインダ支持部材によって上記ビューファインダを支持し、
該ファインダ支持部材を伸縮させることによって接眼部の位置を調節するようにされていることを特徴とする撮像装置。
【請求項２】　ファインダ支持部材は一端部にファインダ連結部が形成されると共に他端部に回動支点部が形成され、上記ファインダ連結部がビューファインダに取着され、回動支点部が撮像装置全体を支持する支持装置に取着されることを特徴とする請求項１に記載の撮像装置。
【請求項３】　ファインダ支持部材は、支持装置の撮像装置の撮影方向を変えるために角度が変化するようにされている可動部分以外の個所に取着されることを特徴とする請求項２に記載の撮像装置。
【請求項４】　ファインダ支持部材は、ファインダ連結部においてはビューファインダに対して回動自在に取着されると共に、回動支点部においても支持装置に対して回動自在に取着されることを特徴とする請求項２に記載の撮像装置。
【請求項５】　ファインダ支持部材は、ファインダ連結部においてはビューファインダに対して回動自在に取着されると共に、回動支点部においても支持装置に対して回動自在に取着されることを特徴とする請求項３に記載の撮像装置。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明はビューファインダの接眼部の位置を調節可能に保持することができるようにした撮像装置に関するものである。
【０００２】
【従来の技術】業務用として用いられる撮像装置の内の一つである、大型のカメラ一体形ビデオテープレコーダ、特に、テレビ局等において、ニュース等の取材（ＥＮＧ）用として用いられるもの（以下単に、「ＥＮＧカメラ」という。）は、一般的に、撮影者の肩の上に載せるようにして支えることによって撮影を行なうという使用状態に適するように操作系、ビューファインダの接眼部の位置、重量バランス等が設計されている。例えば、ＥＮＧカメラのビューファインダーの接眼部は、ＥＮＧカメラを肩に載せて支えた時に丁度、撮影者の目の位置に来るように、ＥＮＧカメラの前方寄りに設けられている。
【０００３】ところで、このようなＥＮＧカメラにおいては、上記したように、元々撮影者の肩の上に載せて支えて使用するように設計されているため、ＥＮＧカメラを三脚等に固定して使用する時は、ビューファインダの接眼部の位置が使用状態に合わないという問題がある。即ち、ＥＮＧカメラを三脚等に固定して使用する時には、ＥＮＧカメラを接眼部を撮影者の目の位置に合わせてかなり高い位置に固定して、左側方から接眼部を覗き込まなくてはならない。
【０００４】そこで、通常のビューファインダに比べて接眼部の位置をより後方に位置するように変えて、三脚等に固定した時にＥＮＧカメラの後方から接眼部を覗き込むようにする大型のビューファインダが用いられる。この様な大型のビューファインダは、例えば、通常のビューファインダと交換してＥＮＧカメラに取り付けるか、又は、通常のビューファインダに付加するようにして取り付けて、接眼部を後方に延長するようになっている。そして、このような大型のビューファインダにあっては、内部にレンズやプリズム等が組み込まれているために重量が重く、それ自体で自立することができない。従って、このような大型のビューファインダは、ＥＮＧカメラに取着されたファインダ支持部材によって下方から支持されるという構造になっている。
【０００５】
【発明が解決しようとする課題】しかしながら、上記したような大型のビューファインダが取着されたＥＮＧカメラにあっては、大型のビューファインダを支持するファインダ支持部材もＥＮＧカメラ自体に取着されているために、ＥＮＧカメラを三脚に固定した使用状態において、ＥＮＧカメラをチルトさせると、この姿勢の変化に同期して大型のビューファインダもこれを支持するファインダ支持部材と共に同期してその位置が上方又は下方に大きく移動してしまい、ビューファインダの接眼部の位置の移動に合わせるため撮影者の撮影姿勢の極端な変化を強要することとなってしまうという問題があった。従って、例えば、高所から撮影用のクレーン上で撮影する場合には、撮影時の姿勢変化が大きいため、安全な撮影用の椅子等に座ったままの撮影ができないので、撮影者は撮影に伴う姿勢の変化によってバランスを崩して上記クレーン上からの転落等の危険にさらされることになる。
【０００６】また、一定の角度に固定しての撮影時においても、接眼部の位置を微調整することができないため、場合によっては撮影者は不自由な姿勢のまま撮影を続けなければならないこともあった。
【０００７】従って、本発明撮像装置は、撮像装置本体の姿勢の変化に関係なく常に一定の接眼部の位置を最適な位置に調整できるようにすることを課題とするものである。
【０００８】
【課題を解決するための手段】上記課題を解決するために、本発明撮像装置は、任意の長さに伸縮によって調整することが可能とされたファインダ支持部材によってビ

ューファインダを支持し、該ファインダ支持部材を伸縮させることによって接眼部の位置を調節するようにしたものである。

【０００９】従って、ビューファインダの接眼部の位置を最適な状態になるように調整することができるようになる。

【００１０】

【発明の実施の形態】以下に、本発明撮像装置の実施の形態について、図示した実施の一例に従って説明する。尚、以下の実施例は、本発明撮像装置をテレビ局等において、ニュース等の取材用として用いられる、所謂ＥＮＧカメラに適用したものである。

【００１１】尚、以下の説明において、上下左右及び前後の方向について述べる時は、図１において、上下の方向をそのまま上下の方向、左方を前方、右方を後方とし、左右の方向については、ＥＮＧカメラを上記後方側から前方側に見た場合の左右の方向をいうものとする。

【００１２】ＥＮＧカメラ１は、カメラとＶＴＲとが一体化された大型のものであり、略箱形の本体部２からは前方に向かって撮像レンズ３が突出し、通常は、本体部２の下部に形成された肩当て部４を撮影者の右肩の上に載せて支え、両手でカメラの操作及び支持を行なう時に最適な状態となるように、その操作系、ビューファインダ５、全体の重量バランス等が設定されているものである。尚、上記本体部２の上方には、運搬用のハンドル６が上方に突出形成され、該ハンドル６の前端部には、マイク７とその左側にファインダ取付部８が前方に向かって突出して設けられている。そして、上記したような状態で撮影を行なう場合には、ビューファインダ５の接眼部９は本体部２の左側に位置すると共に撮影者の顔の右横に位置するようになっており、これが図１に二点鎖線で示す状態である。

【００１３】そして、ＥＮＧカメラ１を、ＥＮＧカメラ１全体を支持する支持装置である三脚１０の雲台１１に固定して使用する場合には、撮影者は三脚の左側から不自由な姿勢でファインダ５の接眼部９を覗き込まなければならず撮影がし難いため、標準のビューファインダ５を大型のロングビューファインダ（以下、単に「ビューファインダ」という。）１２に交換して使用する。ＥＮＧカメラ１のファインダ取付部８にビューファインダ１２を取り付けると、その接眼部１３は前記ビューファインダ５の接眼部９よりも後方に延長され、図１に示すように、三脚１０に固定されたＥＮＧカメラ１の後方から接眼部１３を覗いて撮影を行なうことができるようになる。尚、三脚１０は、図１乃至図３に示すように、雲台１１の図中に円形をした領域として示されているチルト支点部１１ａを中心としてその上方に位置する部分である、ＥＮＧカメラ１の本体部２の下面に取着されてこれを支えている部分が上下方向にチルトするようになっており、上記チルト支点部の下方は非可動部分１１ｂとなっている。

【００１４】上記したビューファインダ１２は、接眼部１３の位置を標準のファインダ４の接眼部９よりも後方に延長するため前後長が長く、レンズ及びプリズム等が略円筒状をした鏡筒１４内に適宜配置され成る。更に、鏡筒１４は、外筒１５とその内部に沿って後方に伸縮自在な状態で取着された内筒１６から成る二重構造を有する。そして、ビューファインダ１２は、図１に示すように、本体部２のファインダ取付部８に取着された部分である支点部１７を中心に上下に角度を変化させることが可能とされると共に、上記鏡筒１４の伸縮によって接眼部１３の前後の位置も調節可能となっている。

【００１５】ところで、ビューファインダ１２は、上記したように、レンズ及びプリズム等が略円筒状をした長い鏡筒１４内に適宜配置され、更に、鏡筒１４は、外筒１５と後方に伸縮自在な内筒１６から成るため、ビューファインダ５に比べてかなりの重量及びサイズを有するものである。従って、ビューファインダ１２は、前部の支点部１７が本体部２のファインダ取付部８に取り付けられるだけでは全体を支持することができず、後部がファインダ支持部材１８によって下方から支えられるようになっている。

【００１６】ファインダ支持部材１８は主要な部分がアルミニウム等の軽量な金属から成り、図１乃至図３に示すように、上端及び下端がビューファインダ１２及び三脚１０に取着され、主アーム１９と、該主アーム１９の内部で支持され、主アーム１９の上端から上下に伸縮自在とされた昇降アーム２０とによって構成される。そして、主アーム１９には、下端に右方に突出した略円筒状の回動支点部２１、上下における中間の位置に左方から見て略四角形の領域を占める昇降操作部２２、上端にストッパ部２３がそれぞれ設けられている。また、昇降アーム２０の上端にはファインダ連結部２４が一体に形成されている。

【００１７】主アーム１９は、図４に示すように、中央の昇降操作部２２から細長い上半部２５及び下半部２６がそれぞれ上方及び下方に向かって延びたものであり、該上半部２５と下半部２６及び昇降操作部２２の前壁、後壁及び右壁が一体に形成され左方に向かって開口したケース体２７と、該ケース体２７の上半部２５及び下半部２６と昇降操作部２２の開口をビス止め等の適宜な方法によって固定される略板状をした蓋体２８、２９及び３０によって各別に覆ったものである。

【００１８】即ち、主アーム１９の上半部２５は、図４及び図６に示すように、この部分においてはケース体２７が略チャンネル状に形成され、蓋体２８が取着された時に上下に延びる略角柱状の空間を画成し、該空間は昇降アーム２０が収納されると共に昇降アーム２０が上下に移動する時のガイド孔３１として機能するようになっている。また、同様に、下半部２６は、図４及び図５に

示すように、この部分においてはケース体２７が略チャンネル状に形成され、蓋体２９が取着された時に長方形の略角柱状の空間を画成し、該空間は昇降アーム２０が収納されると共に昇降アーム２０が上下に移動する時のガイド孔３２として機能するようになっている。尚、ガイド孔３２は、ケース体２７の前後の壁部の厚みが上記上半部２５の前後の壁部の厚みよりも厚くされ、上半部２５における長方形をしたガイド孔３１の形状に対して、前後の開口径のみが短くなって略正方形を為す開口形状を有する。

【００１９】また、昇降操作部２２においては、図８に示すように、ケース体２７の寸法が前後及び左右共に上記上半部２５及び下半部２６よりも大きく形成され、そして、左右両方向に開口し、左方の開口部は前述のように蓋体３０によって覆われると共に右方の開口は略板状をした別の蓋体３３によって覆われている。

【００２０】更に、昇降操作部２２においては、ケース体２７は、隔壁３４によって内部空間が左室３５及び右室３６に分割され、昇降操作部２２の中央には蓋体３０及び中間壁３４を貫通すると共にこれらによって支持された回転軸３７が回転自在な状態で左右方向に延びて配置されている。尚、右室３６は左室３６に比べて左右の幅が狭く、前後の奥行きが約２倍程度の寸法を有するように形成され、これに伴って右室３６に対応した部分のケース体２７の後端壁は左室３６に対応した部分の後端壁よりも後方への突出量が大きくなっている。

【００２１】そして、回転軸３７は、蓋体３０から外部に突出した左端部に操作ハンドル３８が取着され、左室３５内に位置する中間部にピニオンギア３９が固定され、右室３６内に位置する右端部にはフリクションディスク４０が固定されている。尚、該フリクションディスク４０は、隔壁３４の右面に取着された摩擦パッド４１、４１と常に接触した状態とされ、このフリクションディスク４０表面と摩擦パッド４１、４１の表面との摩擦によって、回転軸３７は操作ハンドルに３８に一定以上の力を加えない限り回転しないようになっている。また、ピニオンギア３９は後述する昇降アーム２０の下半部に形成されたラックと噛合するようになっている。

【００２２】更に、主アーム１９の上端のストッパ部２３においては、図４に示すように、ケース体２７及び蓋体２８の上端部に合成樹脂製のキャップ体４２が外嵌固定されている。該キャップ体４２は上端が上端壁４３によって閉塞され下方が開口した略角筒状をした形状を為すものであり、その下半部４４が主アーム１９の上端部に外嵌されて図示しないビス止め等の適宜な方法によって主アーム１９に固定されている。また、キャップ体４２の上端壁４３の中央には後述する昇降アーム２０の上半部の横断面形状と略同じ形状及び開口径を有する角孔４５が形成されている。

【００２３】キャップ体４２の上半部４６には、キャップ体４２の周壁及び上端壁４３によってケース体２７及び蓋体２８の上端の上方に空間が形成されている。そして、キャップ体４２には、図４及び図９に示すように、上半部４６の略中心にガイド軸４７が螺合され、その一端（左端）がキャップ体４２の外方の左側に突出し、他端部はキャップ体４２の内方に突出している。また、ガイド軸４７のキャップ体４２の外方に突出した一端部には操作レバー４８が外嵌されて固定されると共に、キャップ体４２の内方に突出した他端部にはストッパ部材４９が外嵌されて固定されている。従って、操作レバー４８を図９に示す位置から、左方から見て反時計回り方向に約４５度回転させる（図１乃至図３に示す操作レバー４８の位置）と、キャップ体４２に螺合しているガイド軸４７全体が僅かに左方に変位して、ストッパ部材４９も図９における矢印方向（左方）に移動して昇降アーム２０に圧着し、この時の昇降アーム２０とストッパ部材４９との摩擦力によって昇降アーム２０の位置を現在地に固定することができるようになっている。尚、キャップ体４２にはストッパピン５０が埋設されて一部が左方に突出し、操作レバー４８を一定角度回転させると操作レバー４８のリブ５１と当接するようになっており、操作レバー４８を必要以上に回転させることによってキャップ体４２とガイド軸４７との螺合が外れるのを防止するようになっている。

【００２４】昇降アーム２０は、図４に示すように、上半部５２及び該上半部５２に比べて前後の幅のみが約半分程度に細くされた下半部５３から成り、上半部５２の上端には、中央にビス孔を有し稍厚手の円盤状をしたファインダ連結部２４が一体に形成されると共に上下に延びる長孔５４が形成され、下半部５３の後端にはラック５５が形成されている。また、上記上半部５２と下半部５３との境界部５２ａは上半部５２の外径よりもやや太くされて略鍔状に形成され、主アーム１９の上半部２５の内径とほとんど同じとされて主アーム１９のガイド孔３１である上半部２５の内面と接触して昇降アーム２０の昇降動作をガイドするようになっている。

【００２５】そして、昇降アーム２０は主アーム１９に対して、図４に示すような状態で配置される。即ち、上半部５０の長孔５４内にはストッパ部２３のガイド軸４７が位置し、昇降アーム２０の昇降動作に伴ってガイド軸４７は長孔５４内を相対的に摺動して、昇降アーム２０の昇降動作はこれによってもガイドされるようになっている。また、下半部５３のラック５５は主アーム１９の昇降操作部２２においてピニオンギア３９と噛合している。従って、昇降アーム２０は、操作ハンドル３８を回転させると、ピニオンギア３９の回転運動がこれと噛合したラック５５によって上下運動に変換され、昇降アーム２０は操作ハンドル３８の回転方向に合わせて上方又は下方に全体的に移動し、昇降アーム２０の上半部５２が主アーム１９のキャップ体４２の角孔４５から繰り

出し又は繰り戻されて、ファインダ支持部材１８全体の長さが変化するようになっている。

【００２６】昇降アーム２０のファインダ連結部２４は、図１乃至図３に示すように、ビューファインダ１２の内筒１６の後端部に外嵌されて固定された固定リング５６にビス止めされると共に回動自在に取着され、これによって、内筒１６に対して昇降アーム２０はファインダ連結部２４を回動支点にして回動自在するようになる。

【００２７】更に、主アーム１９の下端部の稍前方寄りの位置には、前述したように、回動支点部２１が形成されている。即ち、回動支点部２１は、図７に示すように、ケース体２７の下端部の前方寄りの位置から一体に右方に向かって突出形成されると共に左右双方に開口した略円筒状を為す支持筒５７と、該支持筒５７に内嵌され、ファインダ支持部材１８全体を回動自在な状態で支持した支持軸５８等から成るものである。

【００２８】支持軸５８はその右端が、三脚１０の雲台１１の非可動部１１ｂの後端にその前端が固定された支持板５９の後端を左方から貫通して右方からナット６０を螺合されることによって三脚１０に固定されている。そして、支時筒５７にはベアリング６１、６１が内嵌され、支持筒５７内のベアリング６１、６１に支持軸５８を右方から内嵌し、支持筒５７の左端から左方に突出した支持軸５８の左端部に固定ナット６２を螺合して抜け止めを為す。これによって、ファインダ支持部材１８は、支持板５９を介して三脚１０に固定されると共にその下端部が回動自在に支持されるようになる。

【００２９】このように、ファインダ支持部材１８は、その下端部はＥＮＧカメラ１の本体部２に取着せずに回動支点部２１で雲台１１の非可動部１１ｂに取着されているので、撮影時におけるＥＮＧカメラ１のチルト操作に伴う姿勢変化による位置の変位がファインダ支持部材１８の上部のファインダ連結部２４からファインダ支持部材１８に伝達されるだけで、三脚１０の雲台１１の可動部分の動きと分離されるため、回動支点部２１の位置は移動せずに、ファインダ支持部材１８動きがの回動支点部２１を中心とした回動のみとなって、ビューファインダ１２の接眼部１３の位置の移動を最小限とするようになっている。

【００３０】従って、三脚１０の雲台１１のチルト機構を操作してＥＮＧカメラ１全体を図１に示す水平状態から図２又は図３に示す撮像レンズ３が上方又は下方を向く状態となるようにチルトさせた時には、ＥＮＧカメラ１の姿勢変化がビューファインダ１２とファインダ連結部２４を介してファインダ支持部材１８に伝わり、ファインダ支持部材１８は回動支点部２１を中心として前方又は後方に回動させられる。そしてこの時のビューファインダ１２の接眼部１３の位置は、撮影者が覗き込むには下過ぎるか又は上過ぎてそのまま撮影を続行するには不自由である。そこで、操作ハンドル３８を操作してこれを回転させ、昇降アーム２０を上下に伸縮させることによってファインダ支持部材１８全体の長さを調節して、ファインダ連結部２４の位置を上下に変化させると、ビューファインダ１２は支点部１２を中心として上方又は下方に回動するので、ＥＮＧカメラ１の後方から接眼部１３を覗くのに最適の状態となるようにすることができる。また、ビューファインダ１２の外筒１５と内筒１６から成る鏡筒１４の長さを調節にすることによって、前後方向における接眼部１３の位置の調整も可能である。

【００３１】また、前述したように、昇降アーム２０は、前述のように、ピニオンギア３９を固定した回転軸３７がフリクションディスク４０と摩擦パッド４１、４１との間の摩擦抵抗によって一定以上の力を加えないと回転しないようになっている。このため、通常では、昇降アーム２０及びこれと連結されたビューファインダ１２の重量のみによっては昇降アームが２０は下降しないので、操作ハンドル３８を操作して昇降アーム２０を上下させる場合に、任意の位置で昇降アーム２０の昇降を即座に停止させることができるため、接眼部１３の位置の高さの微妙な位置を微調節して合わせることが可能である。

【００３２】更に、ストッパ部２３におけるストッパ部材４９の昇降アーム２０への圧着を併用することによって、より強固に昇降アーム２０の位置を現状で維持させることが可能である。

【００３３】

【発明の効果】以上に記載したところから明らかなように本発明撮像装置は、請求項１に記載のものは、伸縮によって任意の長さに調整することが可能とされたファインダ支持部材によって上記ビューファインダを支持し、ファインダ支持部材を伸縮させることによって接眼部の位置を調節するようにしたので、三脚等の支持装置に撮像装置を固定して使用する時も、撮像装置の姿勢に関係なく接眼部を最適な位置に来るように調節することができる。

【００３４】また、請求項２に記載した発明にあっては、ファインダ支持部材は一端部にファインダ連結部を形成すると共に他端部に回動支点部を形成し、ファインダ連結部をビューファインダに取着し、回動支点部を撮像装置全体を支持する支持装置に取着するようにしたので、撮像装置の姿勢変化による影響をファインダ支持部材が受け難くなる。

【００３５】更に、請求項３に記載した発明にあっては、ファインダ支持部材は、支持装置の撮像装置の撮影方向を変えるために角度が変化するようにされている可動部分以外の個所に取着するようにしたので、ファインダ支持部材は支持装置の可動部の動きに伴う影響を受けることがない。

【００３６】更にまた、請求項４及び請求項５に記載した発明にあっては、ファインダ支持部材は、ファインダ連結部においてはビューファインダに対して回動自在に取着すると共に、回動支点部においても支持装置に対して回動自在に取着するようにしたので、撮像装置を撮影時においてその姿勢を変化させる時に、その姿勢を変化させる動作にファインダ支持部材が悪影響を与えることがない。

【００３７】尚、前記実施例において示した具体的な形状及び構造は、本発明を実施するに当たっての具体化のほんの一例を示したものに過ぎず、これらによって本発明の技術的範囲が限定的に解釈されることがあってはならないものである。

【図面の簡単な説明】

【図１】本発明撮像装置を三脚に取り付けて使用する状態を示す側面図である。

【図２】撮像装置を下方にチルトさせた時の状態を示す側面図である。

【図３】撮像装置を上方にチルトさせた時の状態を示す側面図である。

【図４】ファインダ支持部材を拡大して示す縦断面図である。

【図５】図４におけるＶ－Ｖ線に沿う拡大断面図である。

【図６】図４におけるＶＩ－ＶＩ線に沿う拡大断面図である。

【図７】図４におけるＶＩＩ－ＶＩＩ線に沿う拡大断面図である。

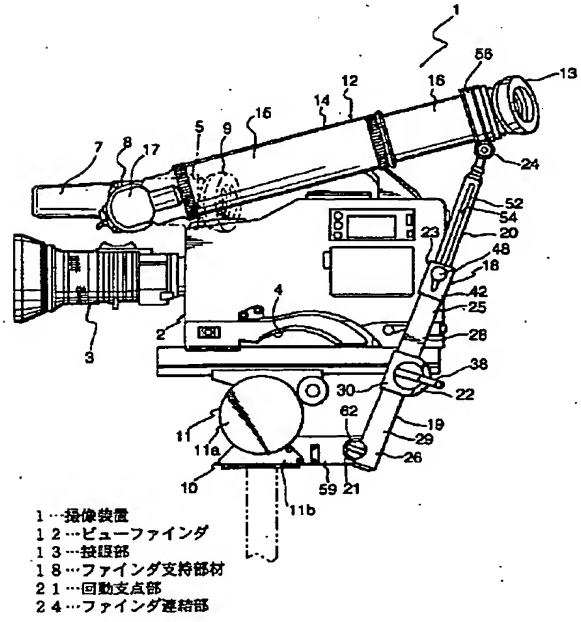
【図８】図４におけるＶＩＩＩ－ＶＩＩＩ線に沿う拡大断面図である。

【図９】図４におけるＩＸ－ＩＸ線に沿う拡大断面図である。

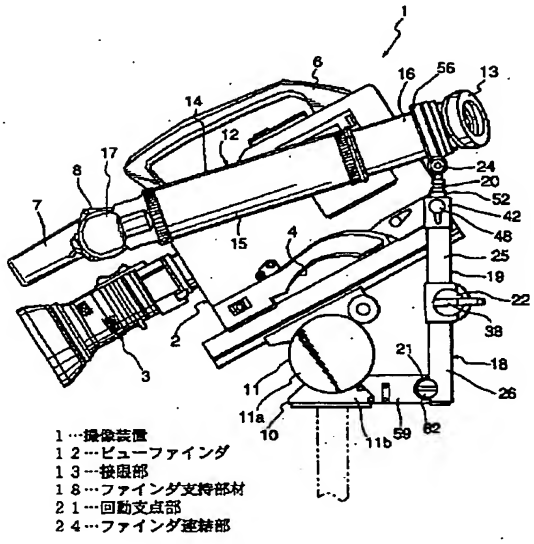
【符号の説明】

１…撮像装置、１２…ビューファインダ、１３…接眼部、１８…ファインダ支持部材、２１…回動支点部、２４…ファインダ連結部

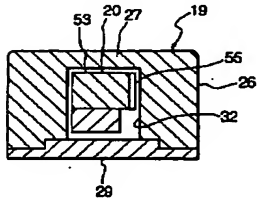
【図１】



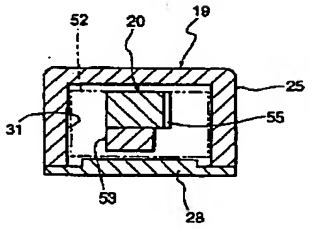
【図３】



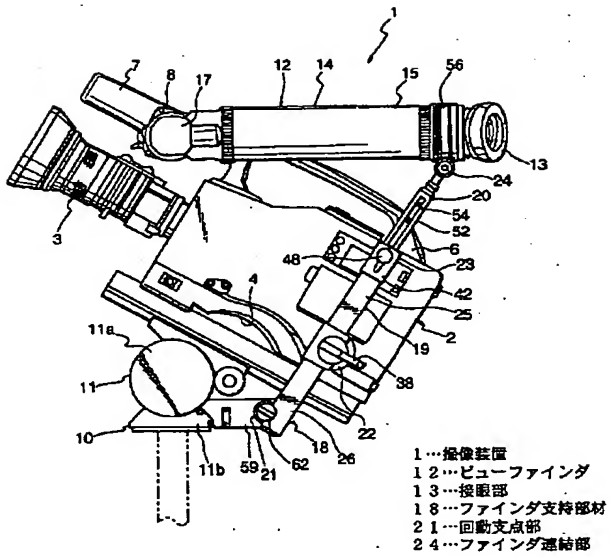
【図５】



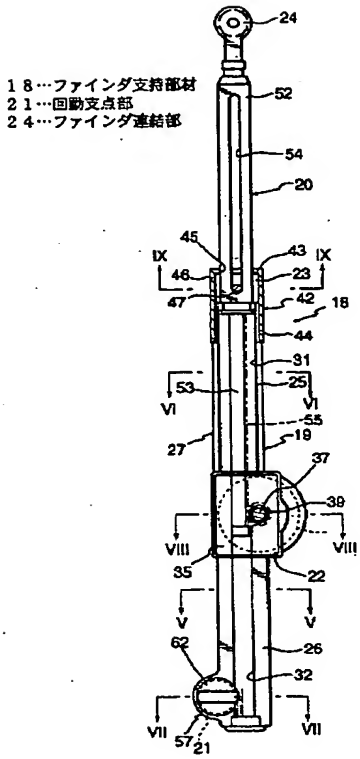
【図６】



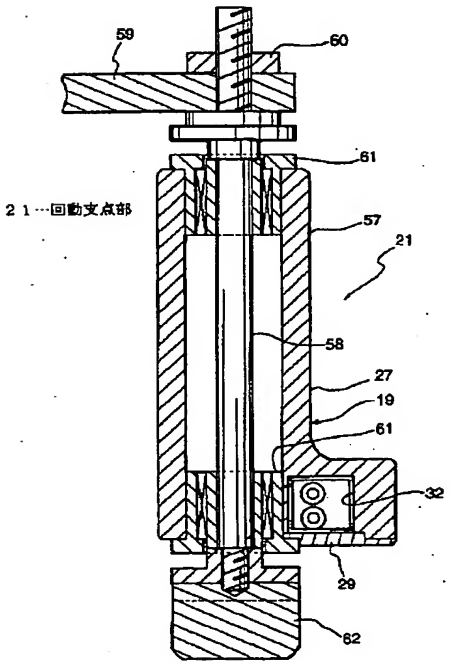
【図２】


1…撮像装置
12…ビューファインダ
13…接眼部
18…ファインダ支持部材
21…回動支点部
24…ファインダ連結部

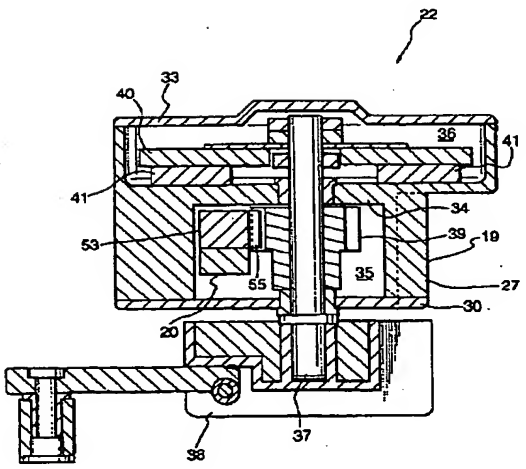
【図４】


18…ファインダ支持部材
21…回動支点部
24…ファインダ連結部

【図７】


21…回動支点部

【図８】



【図９】